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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,748

03/21/2006

Koichi Aizawa

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EXAMINER

VU, DAVID HUNG

ART UNIT

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2821

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/572,748	AIZAWA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	David Hung Vu	2821	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 13, 20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14 and 16-19 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/07/09, 3/21/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of claims 11-12 and 14-19 in the reply filed on 1/17/2009 is acknowledged.
2. Claims 13 and 20-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/17/2009.

### ***Claim Objections***

3. Claim 19 is objected to because of the following informalities: "an first selector" should properly be ---a first selector---. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation "...the object is a dry gas" renders the claim confusing in that in claim 1 the object is being recited as an element being attached to the holder (drawing, figure 1). Thus, it cannot be considered as a gas substance.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2821

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1,4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito, US Pat No 6,236,156.

Ito inherently discloses a method of modifying an object with electrons comprising the steps of providing a cold-cathode electron emitter 5, which has the capability of emitting and accelerating electrons from a planar electron emitting portion according to tunnel effect; applying a voltage to the emitter to emit the electrons from the planar electron emitting portion; exposing the object 110,4 to the electrons, see, for example, abstract, figures 1-4,6, and 8, column 2, lines 11+, columns 5-6, column 7, lines 45+, column 9, lines 1-36.

Regarding claim 7, at least column 9, lines 1-37 disclose such gas.

6. Claims 1,3-4, and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomoaki, JP Pat No 2002-049226.

Tomoaki inherently discloses a method of modifying an object with electrons comprising the steps of providing a cold-cathode electron emitter 6,16, which has the capability of emitting and accelerating electrons from a planar electron emitting portion according to tunnel effect; applying a voltage to the emitter to emit the electrons from the planar electron emitting portion; exposing the object 7a to the electrons, see, for example, figures 3-5,8-10, pages 5-6,8-10, and 15 of the translation.

Regarding claims 4 and 7-8, at least pages 5-6,8,10 and 15 do disclose such atmospheric pressure and one of oxygen and nitrogen.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 5-6, 8-11, 14, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito.

Ito, as discussed from the above, essentially discloses the claimed invention including voltage applying means V1,V2,Eg,Ea, but fails to explicitly disclose a case with an opening through which electrons or a gas activated are provided. Ito does disclose a case (see, figures 6 and 8). It would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have provided an opening in the case; thus, electrons or activated gas would have been supplied through the same.

Regarding claim 3, the selection of certain atmospheric pressure would have been considered obvious to one of ordinary skill in the art so as to enhance treatment efficiency and uniformity.

Regarding claims 5-6, the selection of certain electron energy levels, 1-50 keV or 1-100eV, would have been obvious to one having skill in the art at the time the invention was made since it has been held that where the general conditions of a claim

Art Unit: 2821

are disclosed in the prior art, discovery the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8-9, selecting oxygen or nitrogen as well as a gas with smaller electron affinity than oxygen also would have been considered obvious to one of ordinary skill in the art so as to enhance treatment efficiency and uniformity.

Regarding claim 10, one of ordinary skill in the art would have known how to have placed the object in direct contact with the emitting portion since rearranging of part would have involved only routine skill in the art.

Regarding claim 14, one of ordinary skill would have known how to have employed an intake port; thus, means for supplying gas would have been realized.

Regarding claims 16-17, at least figure 2 shows anode 7a for accelerating the electrons.

9. Claims 2,12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Hatai et al (hereinafter Hatai), US Pat No 6,285,118.

Ito, as discussed from the above, essentially discloses the claimed invention but fails to explicitly disclose field drift layer including nanocrystalline silicon between the electrodes. Hatai discloses field drift layer 6 including nanocrystalline silicon between the electrodes (see, for example, abstract, figures 1-2,5,8,11-12, column 11, lines 3+, claim 4). It would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have employed such field drift layer; thus, electrons would have been attracted to the object faster.

Art Unit: 2821

Regarding claim 18, figure 11 shows the claimed arrangements of electrodes 31 and 7 and figure 5 shows voltage means  $V_c, V_{ps}$  for applying voltage to the electrodes.

10. Claims 5-6, 9-11, 14, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoaki.

Tomoaki, as discussed from the above, essentially discloses the claimed invention including voltage applying means 8-9, 18-19 but fails to explicitly disclose a case with an opening through which electrons or a gas activated are provided. However, providing a casing with such opening would have been considered obvious to one of ordinary skill in the art. It would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have provided a casing having an opening therein; thus, electrons or activated gas would have been supplied through the same.

Regarding claims 5-6, the selection of certain electron energy levels, 1-50 keV or 1-100eV, would have been obvious to one having skill in the art at the time the invention was made since it has been held that where the general conditions of a claim are disclosed in the prior art, discovery the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 9, a gas with smaller electron affinity than oxygen also would have been considered obvious to one of ordinary skill in the art so as to enhance treatment efficiency and uniformity.

Regarding claim 10, one of ordinary skill in the art would have known how to have placed the object in direct contact with the emitting portion since rearranging of part would have involved only routine skill in the art.

Regarding claim 14, one of ordinary skill would have known how to have employed an intake port; thus, means for supplying gas would have been realized.

Regarding claims 16-17, at least figures 3 and 9 show anode 7a for accelerating the electrons.

11. Claims 2,12, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoaki in view of Hatai et al.

Tomoaki, as discussed from the above, essentially discloses the claimed invention but fails to explicitly disclose field drift layer including nanocrystalline silicon between the electrodes. Hatai discloses field drift layer 6 including nanocrystalline silicon between the electrodes (see, for example, abstract, figures 1-2,5,8,11-12, column 11, lines 3+, claim 4). It would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have employed such field drift layer; thus, electrons would have been attracted to the object faster.

Regarding claim 18, figure 11 of the Hatai shows the claimed arrangements of electrodes 31 and 7 and figure 5 shows voltage means  $V_c, V_{ps}$  for applying voltage to the electrodes.

Regarding claims 18-19, Figure 8, pages 9-10 of the Tomoaki do disclose such electrode arrangements and voltage supplying means. The employment of the



Art Unit: 2821

selectors would have been considered obvious to one of ordinary skill in the art for the purpose of applying different voltages at different period of time to the electrodes.

***Allowable Subject Matter***

12. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Hung Vu whose telephone number is (571) 272-1831. The examiner can normally be reached on M-F 9:00am-5:30pm.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David Hung Vu/

Application/Control Number: 10/572,748  
Art Unit: 2821

Page 9

Primary Examiner  
Art Unit 2821

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